

Amendment(s) to the Drawings:

The attached sheet of drawings includes changes to Fig. 2C. The changes to Fig. 2C are to withdraw the changes made to Fig. 2C in the amendment filed October 26, 2006. This sheet replaces the original sheet including Fig. 2C.

Attachment: Annotated Sheet Showing Changes
Replacement Sheet

REMARKS/ARGUMENTS

Office action summary

Applicants' attempt in the October 26, 2006 amendment to withdraw an earlier amendment to Fig. 2C is found not to be in compliance with 37 CFR 1.121(d).

Claims 14, 16-18 and 33 are rejected under 35 USC 103(a) as being unpatentable over Applicants' Prior Art (hereinafter "AAP") in view of US Patent No. 6,147,381 to Hirler et al. (hereinafter "Hirler") and US Patent No. 5,151,762 to Uenishi et al. (hereinafter "Uenishi").

Claim 15 is rejected under 35 USC 103(a) as being unpatentable over AAP, in view of Hirler, Uenishi, US Patent No. 5,793,064 to Li (hereinafter "Li") and US Patent No. 4,987,098 to Hishiura et al. (hereinafter "Nishiura").

Claims 19 and 32 are rejected under 35 USC 103(a) as being unpatentable over AAP, in view of Hirler, Uenishi, and US Patent No. 5,008,720.

Objection to the drawings

Applicants' attempt in the October 26, 2006 amendment to withdraw an earlier amendment to Fig. 2C is found not to be in compliance with 37 CFR 1.121(d). Drawing amendments are resubmitted herewith in compliance with 37 CFR 1.121(d). Withdrawal of this objection is respectfully requested.

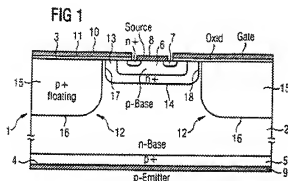
Claim Rejections

Claims 14, 16-18 and 33 are rejected under 35 USC 103(a) as being unpatentable over AAP, in view of Hirler, and Uenishi. This rejection is respectfully traversed for the following reasons.

Claim 14 distinguishes over AAP, Hirler, and Uenishi taken singly or in combination at least by reciting:

a first well region of a second conductivity ... coupled to an emitter terminal; a second well region of a second conductivity ... being in a floating state; ... where the first well region and the second well region have a substantially same depth in the drift region

The Examiner indicates that the claimed "first well region" is shown by region 108 in Fig. 2A of APA, and the claimed floating "second well region" is shown by region 15 in Fig. 1 of Hirler. Fig. 1 of Hirler is reproduced below.



As shown in Fig. 1 and explained by Hirler, p+ floating regions 15 are disposed on each side of shielding zone 13 (see col. 3, lines 64-67). Shielding zone 13 is n+ doped and has a distinctly higher doping concentration than inner zone 2 surrounding it (see col. 3, lines 61-64). Embedded within the shielding zone 13 is p-doped base zone 6 (col. 3, lines 45 and 61).

At col. 5, lines 2-13, Hirler states:

"What is **essential** in this case is that the non-connected, floating regions 15 of the opposite conduction type have a penetration depth which is **distinctly greater** than the penetration depth of the shielding zone into the inner zone. The purpose of the non-connected, floating regions of the opposed conduction type with respect to the shielding zone 13 is to shield the regions directly at the cathode side, that is to say directly under the base zone 6, in other words to prevent the course of the equipotential lines from reaching as far as the lower edge of the base zones 6. This

achieves a high blocking strength in addition to a very small V_{CESat} ." (Emphasis added)

Thus, to achieve a high blocking strength and a small V_{CESat} , Hirler requires that p+ floating regions 15 have a depth "distinctly greater" than that of shielding zone 13. Since p-doped base zone 6 is fully embedded within shielding zone 13, then by extension, Hirler requires that p+ floating regions 15 have a greater depth than the embedded p-doped base zone 6. Thus, Hirler fails to teach or suggest two well regions that have substantially the same depth, as recited in applicants' claim 14.

The Examiner then relies on the combination of AAP and Uenishi to arrive at the above claimed features. The Examiner asserts that while AAP does not show the second well region, Uenishi in Fig. 8 shows two well regions 705 that have substantially the same depth. This is respectfully traversed because both well regions 705 in Fig. 8 of Uenishi are connected to cathode terminal K and thus neither well region 705 is "in a floating state" as required by claim 1. To the extent that the Examiner relies on the floating p+ regions 15 of Hirler to arrive at the claimed "second well region ... being in a floating state," it is respectfully submitted that Hirler requires that such floating p+ region extend deeper than the p-type shielding zone 13, as set forth above. Thus, combining the teachings of Hirler with AAP or Uenishi results in formation of two p-type regions that are not of "substantially the same depth" as required by claim 1.

Thus, it is respectfully submitted that claim 1 and its dependent claims 15-20 and 32-33 distinguish over AAP, Hirler and Uenishi taken singly or in combination at least for the above reasons.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

/Barmak Sani/

Barmak Sani
Reg. No. 45,068

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
BXS:gjs

Attachments

- 1 annotated sheet (Fig. 2C)
- 1 replacement sheet (Fig. 2C)

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FIG. 2C
(PRIOR ART)

